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A COMMITTEE ON RESULTS

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School organization is for the most part of such a type that it emphasizes the giving of instruction. There is little or no energy set aside in the ordinary school for the checking of results. Many teachers who are aware of the demand for careful tests and are acquainted with the theory of such tests are not encouraged under existing conditions to make tests in their own classes. Furthermore, if some energetic teacher undertakes tests in his field, the results are not as valuable as they might be if they could be made part of a general co-operative plan. Sometimes two teachers in a school, or two departments, are working on problems having many elements in common, without either having any knowledge of the investigations of the other. If their results had been available to all the members of the faculty, it might have been possible to establish a type of co-operation which would have eliminated useless repetition, and would have made all the work much more significant. Hence, some agency in a school should be in contact with every educational experiment going on. From this co-ordinating agency all the teachers may receive advice or directions as to scientific procedure, and through it, results may be made available to the teachers of the school.

In some cases this centralizing agency will doubtless be the principal. Indeed, it is undoubtedly one of the wisest forms of supervision that can be set up when the principal induces each department to test its own results. But even the principal requires co-operation in work of this kind if it is to

become general in a school. The following paper is a description of the work of a committee created in the summer of 1918 in the University High School of the University of Chicago, known as a Committee on Results, and charged with the responsibility of stimulating testing throughout the school and of co-ordinating such work done by the various departments.

The University of Chicago High School is strictly a laboratory school and during the last ten years departmental tests have gradually increased. Every department is now engaged in one or several educational experiments, and the need of some central organization of all this work became very apparent. This led the faculty to create the committee. The chairman was appointed by the faculty, and it was left to him to determine the size of the committee and to select the members. The committee was to find its own field of work. A fund was created to cover the expenses of all work of a purely clerical character, such as making of graphs, typewriting, and mimeographing. There was also a special fund to purchase materials needed to carry on the work.

At the beginning of the school year the organization of the committee was complete. The members had been chosen with a view toward securing representatives from all divisions of the school's work. The principal of the school volunteered to attend all of the meetings. In fact, these meetings were open to all teachers. They were invited to come and urged to take part in the discussions.

The committee was found to be a convenient agency for carrying on several types of work during the year. Most of this was closely related to the testing going on in the school. For example, investigations were made as to the practices of the faculty in giving tests, such as the frequency with which tests were given by the teachers and departments, the amount of time used in reviewing for the tests, the length of time needed to give the tests, the best schedule for giving final

semester examinations, and the value assigned to them in deciding the final grade the pupil is to receive for the course. In this paper only one phase of the work is to be described, the committee's activity in the making of tests and measuring results.

From the beginning, much of the committee's time was taken up in assisting teachers in the technique of testing. To make every teacher in the school familiar with the essentials of scientific measurement, a member of the faculty of the College of Education was invited to give several lectures on this subject. These lectures were not allowed to conflict with, or to displace, regular faculty meetings. They were well attended and were very helpful, especially to those who were not well acquainted with the literature on testing.

Another step in the same direction was to make every teacher familiar with all the tests in his field. For this purpose one member of each department was appointed to work up the bibliography of testing in that field. He was asked to make a report containing the name of the author, title, name and address of publisher, or source of each test, a copy and brief description of every test, and a summary classifying and comparing all the tests with reference to the principal characteristics and values. These reports were mimeographed and made available to all of the teachers. At the present time the committee has received complete reports from the departments of science, mathematics, Latin, social science, English, and home economics.

During the progress of the various experiments going on in the school, the committee gave assistance and information as to the technique of testing and measuring wherever it was needed. Often the experience with one problem suggested a way of overcoming similar difficulties arising in another field. Indeed, many of the questions which arose were common, and because of its general experience, the committee was often

able to save the time and effort of the teachers. When an experiment reached the point where the work to be done was mainly of a clerical nature, it was turned over to some graduate student of the College of Education who was paid for his services.

The fact that the formulation of a problem and the planning of an experiment in one department frequently indicated a mode of attack to another department suggested to the committee the idea of a special open meeting for the purpose of hearing a detailed report. For example, the English Department explained the nature of the tests given to measure a few of the concrete aims of the teaching of freshman English, the use made of the results in regrouping the first-year classes, and the changes in instruction intended to give these groups such teaching as was most suitable to their needs. It was further shown how these tests had raised a number of new and interesting problems.

The aim and purposes of high-school instruction are not always clearly defined. Through the efforts of the committee to help some teachers to formulate concrete aims, these teachers were led to undertake the problem of measuring the extent to which these aims were accomplished with the pupils.

Following the definition of aims comes the making of suitable tests. Here again the broad experience of the committee enabled it to render valuable assistance. It was competent to help in the working out of uniform instructions to be given to the pupils taking these tests, in developing systems of marking to facilitate the grading of the papers, in interpreting the meaning of the results, and in making graphical representation of these results. Frequently this helped the progress of the experiment, or saved it from the fate of being abandoned. Occasionally the committee was able to give assistance when the complexity of the problem seemed very great, or to point out to the teacher new and definite problems. The latter really has been one of the important outcomes of all testing.

The tests furnished material to be used as a study of the results of teaching and led to improvement of methods of attaining better results in the future.

When a school undertakes to test the results in one or even all of the departments, there is danger of overburdening the pupils with a large number of reviews and with extra work. This caused the committee to study the question of regulating the testing done in the school. Certain days were reserved for tests given at regular intervals by some departments. The other departments were asked to notify the office if they wished to give a test. Notices announcing the test were then sent out from the office to all of the teachers. This removed the possibility that the pupils would have to prepare for more than one test on the same day.

At the end of the school year the committee asked each department to make a careful report on the work of the past year. These reports were to contain at least the following points: (1) A bibliography of the standardized tests in the subject, as outlined above. (2) A report on exactly what the department had done in testing during the year. This includes samples and description of the tests actually performed; a statement of the number of tests given to special classes, departmentally, or comparing our own pupils with other schools; a statement of the aims and purposes of the tests; a statement of some or all of the results; a discussion of the usefulness of these tests; future developments and changes to be made. (3) A description of the major problems on which the department worked during the year and of their present state of development.

The committee gave considerable help in the making of these reports. At this time several departments have already sent in complete reports, and others have made preliminary reports for the purpose of first getting the criticism or approval of the committee. These reports will be available to the

teachers at the beginning of the new school year so that every department will be able to take up the work where it was left at the close of this year.

In the space allowed for this article it will be possible to make only such brief summaries of these reports as are given below. It is hoped that ultimately all of the material will be ready for publication. Some of it will doubtless be published in the near future.

MATHEMATICS

The Department of Mathematics has made a careful analysis of the details of the subject-matter used in the first three years. The tests contain problems typical of all the phases of the work. A scheme was devised for dividing the solution of each problem into its component parts and careful records were kept showing to what extent the pupils succeeded. The study has led to the following results: the development of definite principles for the making of suitable tests for the purpose of diagnosis; detailed information to be used to improve instruction; the determination of a large number of errors and difficulties; a study to determine the relative order of difficulty of the processes, and a study of the varying difficulty of the same process in different situations; the development of a technique to overcome them, and to remove unnecessary difficulties; the development of keys to be used in scoring the tests; a method of determining uniform grades; an improvement in neatness and accuracy of all the written work done by the pupils. Next year the Department will use the results of these tests to improve the method of teaching the subject, as detailed records for the work of each chapter are available.

HISTORY

The tests given in the History Department have been designed in large part to assist the instructor in grading pupils and in evaluating methods of instruction. In modern history

classes an attempt was made to discover the relative difficulties of different questions with a view toward determining what topics should be taught, the materials to be used, and the attainments to be secured by the pupils.

FRENCH

The French Department, which is much interested in the question of teaching pronunciation by the phonetic method, originated a pronunciation test with which to control in a very definite way the results obtained. French pronunciation was resolved into its primary factors and the principles which are contained with these factors were definitely set down. Then a model sentence was taken which, when read in various ways, would show whether the student could apply these principles accurately. As the pupil read, each defect was recorded on a specially prepared score-card. Certain new and surprising facts were definitely established, namely, that the previous judgment of pronunciation was very inaccurate and that in the teaching of pronunciation, the emphasis was not properly placed. Furthermore, the uniform basis upon which the results were judged proved to be very satisfactory to teachers and students.

GENERAL SCIENCE

Factual tests and terminology completion tests have been carried on in general science throughout the year. These tests are similar to those suggested by Starch's test for physics. Here, however, instead of emphasizing principles of science, the tests have attempted to measure the acquisition by pupils of science terms and facts. Reasoning completion tests were also attempted but found to be unsatisfactory in their present form.

With the completion of each unit of work in the science course the factual completion tests were given. The results of these tests were:

1. An economical review of important phases of the course.
2. A stimulation of competition between pupils and classes.
3. An acquisition, on the part of the teachers, of the definite knowledge needed to modify our methods of teaching and especially to emphasize meanings of new terms met in the course.
4. Finally, an appreciation of the value of such or other tests in all science classes and a preliminary step in the formulation of better tests.

Next year it is planned to give a series of tests to all classes in the Department. These tests are being prepared at present. It is the aim to make the tests specific to each unit of work rather than make one test for a complete year's course in any science. However, it is possible that such a general test may be the outgrowth of the specific tests.

MANUAL TRAINING

Very significant improvement of testing work carried forward by the Manual Training Department during the year was conducted in connection with a class in blacksmithing. This work centered around what has usually been termed the speed test and was intended to develop material helpful along two specific lines: first, the development of a standard scale for rating students in this department; second, improvement in instruction and execution growing out of performance that the maximum speed consistent with desirable methods of work might be attained. As a result of these tests a complete record of the progress of each student in the course was accumulated during the year.

These speed tests were given at the end of the period devoted to a given unit of constructive work. For example, in connection with the making of center punches, the work was carefully demonstrated for the sake of analysis and the establishment of good form. This was followed by execution

either in single unit or duplicate by the members of the group. After considerable practice had been given in this connection, the instructor again demonstrated the process with the point of view of eliminating waste motion and of reducing the time to that approaching trade practice. The performance and time of the instruction in this demonstration became an item of record and a standard of trade performance. All members of the group then produced this unit of work under time and controlled conditions.

As a result of this speed test performance, it was found that there was a marked improvement in both speed and quality of work. Individual students whose performance was carried forward on a relatively low level under ordinary class conditions showed marked improvement when stimulated to speed up production, all of which goes to show that much of the shop practice carried forward in our school laboratories has not been keyed up to the basis of functional performance, in many cases much more readily attainable than that heretofore thought desirable because of certain conditions growing out of the school organization.

LATIN

The Latin Department has given a series of tests in all the courses of the Department, once a month in the first- and second-year classes, and once in six weeks in the third- and fourth-year classes.

The aim has been, first, to determine definite measures which could be applied with a large degree of accuracy in determining the standing of pupils; secondly, to determine whether there was need for change of emphasis in teaching either in the Department as a whole or in any recitation section; thirdly, to discover the needs of individual pupils, and so make possible the most effective administration of the work of the study class. The more formal first-year tests were

made up, either wholly or in part, of sentences for translation from English into Latin. The errors found in the papers written by pupils were listed according to grammatical relation involved. In the second year, in addition to translation and the writing of Latin, a certain amount of syntactical classification of words was tested. The difficulties of individual pupils were determined as being concerned primarily with translation, syntax, or the writing of Latin.

As a result of this general systematic testing, teaching has been made more definite. Pupils have been more insistently made to see the specific type of error which appeared in their work and to have a better understanding of sentence structure. In the criticisms of incorrect English usage by members of the class, they more readily recognize and name the exact character of the error.

Through the courtesy of the English Department, the Latin Department has been able to undertake a series of special tests, the purpose of which is to determine how far the pupil's knowledge of Latin words aids him in understanding English words derived from, or etymologically related to, these words. Thus, the Department hopes to find the best means of securing for the pupil the greatest possible immediate, practical value from the study of Latin.

ENGLISH

The English Department during the first semester 1918-19 undertook a series of experiments in ninth-grade English, the primary purposes of which may be stated as follows: first, the grouping of pupils into sections composed of children at approximately the same level of language attainments; secondly, the differentiation of instruction in accordance with these varying language needs; thirdly, the substituting of instruction in rapid reading in content material for the intensive study of a few great masterpieces.

The pupils were tested in two general phases of language attainment. The first series of tests, designated as "Reading Tests," included devices for determining the rates at which pupils read and the extent to which they understood the content read. The second series, designated as "Language Tests," was designed to determine the attainment of the pupils in the mechanical aspects of written expression.

At the end of the first week, pupils were redistributed as the result of the tests into six groups, each composed of pupils of approximately the same level of language attainment. The three sections which met in the 9:00 o'clock classes were distributed solely on the basis of the language tests. Three classes which met at the 11:00 o'clock period were assigned solely on the basis of the reading tests, rate, and comprehension. The administrative device, placing three reading sections at one hour, and three language sections at the same hours, was necessary in order to shift pupils back and forth as the time progressed and to regroup pupils later on the basis of progress made during the first semester.

At the end of the semester's work the entire freshman class was given two series of tests which so far as possible were designed to be equivalent to the tests given in October. The purpose was to determine what changes had taken place in the accomplishments of the pupils as a result of the differentiated instruction which had been given. Three tests of the rate of silent reading were used, similar in character to the tests for rate which had been given at the beginning of the semester.

The results showed that the sophomore class read in thirty minutes a total of 634 pages of the material included in the first rate tests and that they read in the same length of time a total of 651 pages of the material given in the second rate test. Only 17 more pages were read of the material for the second test than for the first test. Hence it may be concluded that

the selections included in each of the two tests were approximately equal in difficulty. Three comprehension tests were given at the end of the semester, comparable in character and difficulty to those which were given first.

HOME ECONOMICS

The Department of Home Economics has made a statistical study of the present status of this subject in the public schools with a view toward offering constructive suggestions concerning its improvement. A summary has been made of the main functions of home economics and of its general and specific purposes. Finally, a series of content and reasoning tests has been worked out for the purpose of determining when to place emphasis in teaching. The greatest usefulness of these tests will probably be in the possessing of a critical attitude toward what is now being taught.

Another type of tests designed by the Department aims to measure skill in machine sewing. Since the tests were given in a number of schools, detailed directions for giving the tests have been worked out.